

Differences Between 2024 vs 7075 Aluminum Alloy

2024 Aluminum vs. 7075 Aluminum

Aluminum is one of the most widely used metals in commercial applications, ranging from everyday consumer products to commercial aircraft. At GNEE, we provide a broad selection of high-quality aluminum alloy products, including 2024-T351 and 7075-T651 aluminum plates.

Among the many aluminum alloys available, **2024 aluminum** is one of the most recognized aircraft-grade alloys. It is an excellent choice when a material with a superior strength-to-weight ratio is needed. With outstanding strength and fatigue resistance, 2024 aluminum is widely used in aerospace applications.

The **aerospace industry** also relies on **7075 aluminum alloy**. Zinc is the primary alloying element, giving this 7000-series aluminum exceptional strength—comparable to certain types of steel. While extremely strong, 7075 aluminum has lower weldability, machinability, and corrosion resistance than some other common aluminum alloys.

2024 Aluminum

Properties of 2024 Aluminum

Developed by Alcoa in 1931, 2024 aluminum has become a preferred material for aircraft applications, often replacing 2017-T4 in many designs. Its notable properties include high strength, stiffness, and resistance to stress corrosion cracking. The alloy also offers excellent shearing resistance and can perform well under extreme temperatures. While corrosion resistance is limited in low-atmosphere, marine environments, this can be mitigated with painting or cladding—bonding the aluminum with a high-purity alloy for added protection.

Benefits of 2024 Aluminum

Copper is the main alloying element in 2024 aluminum, providing enhanced fatigue resistance and additional strength. This alloy can withstand high levels of stress and strain over long periods, making it ideal for aircraft, marine applications, structural components, transportation parts (such as truck wheels), and hardware that require fatigue resistance. It is also used in certain military aircraft applications, including high-temperature engine components.

2024 aluminum can be flash, spot, or seam welded. It is highly machinable, easy to work with, heat treatable, and often available in extruded, sheet, and plate forms.

Applications in the Aircraft Industry

2024 aluminum is used in hydraulic manifolds, wing skins, fuselage components, wing tension members, and engine parts. Alclad versions are particularly valuable for fuselage skins in both commercial and military aircraft.

7075 Aluminum

Properties of 7075 Aluminum

7075 aluminum is a high-strength alloy commonly used in highly stressed components. Applications span aerospace, defense, automotive, and manufacturing. It is also used in consumer products such as camping utensils, tactical equipment, hobby-grade RC models, competition yo-yos, and mold-making due to its high strength, thermal properties, and polishability.

7075 aluminum is available in several tempers, including 7075-O, 7075-T6, and 7075-T651. While zinc is the primary alloying element, other elements like iron, silicon, chromium, magnesium, and trace aluminum contribute to its high strength-to-weight ratio, making it ideal for aerospace and aircraft applications where lightweight, durable materials are essential.

Processing 7075 Aluminum

Resistance welding can yield effective results, though gas or arc welding may compromise its natural corrosion resistance. Machining is easier in the annealed condition, and forming is more manageable in this state, though forming is generally not recommended.

Applications of 7075 Aluminum Plate

7075 aluminum's combination of light weight and toughness makes it well-suited for aerospace, aircraft, and automotive industries. It is used to produce structural components such as valves, gears, fuses, and other parts that endure high stress, offering a balance of malleability, strength, and durability.

GNEE supplies both 2024 and 7075 aluminum alloys, offering high-performance solutions for aerospace, defense, and industrial applications.